

Publications

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2021

## Effective Research Presentations

Emily Faulconer

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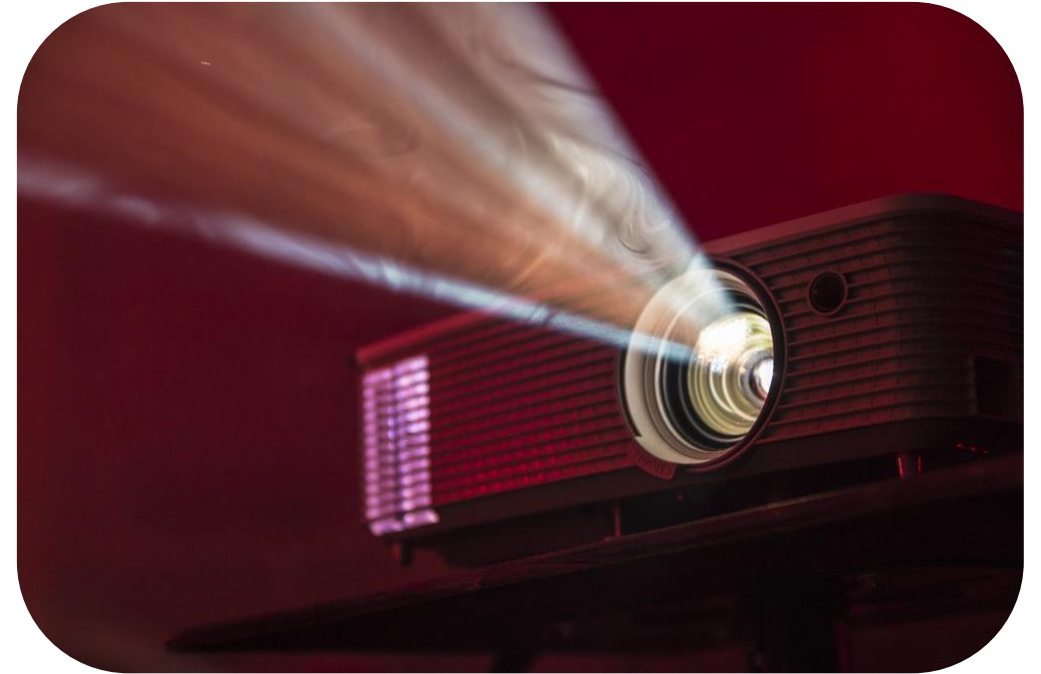
A man in a dark suit and white shirt is presenting in a library. He is holding a small object in his right hand and gesturing with his left. Behind him is a large screen displaying text. To the left is a tall wooden bookshelf filled with books. The background is slightly blurred.

# Effective Research Presentations

Emily Faulconer & Jeremy Ernst

# Posters and conference presentations share similar components.

- ✓ Background
- ✓ Research Question/Hypotheses
- ✓ Methodology
- ✓ Findings
- ✓ Conclusions



# Key functions of posters and conference presentations are networking and reputation-building.

✓	form of academic expression
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✓	summary of research
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✓	visually-supported interaction
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# Step 1: Plan your approach.

- Identify sections
- Craft your key take-away(s)
- Determine what to represent visually



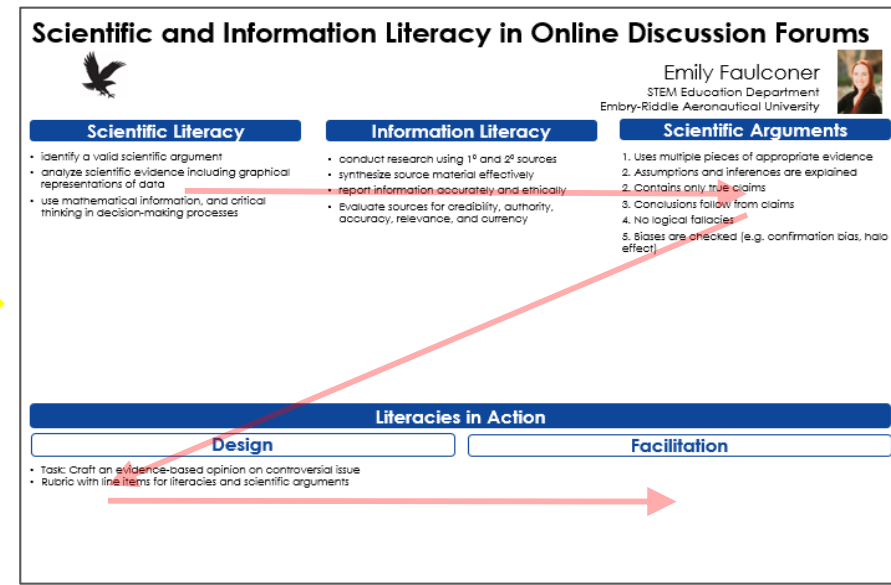
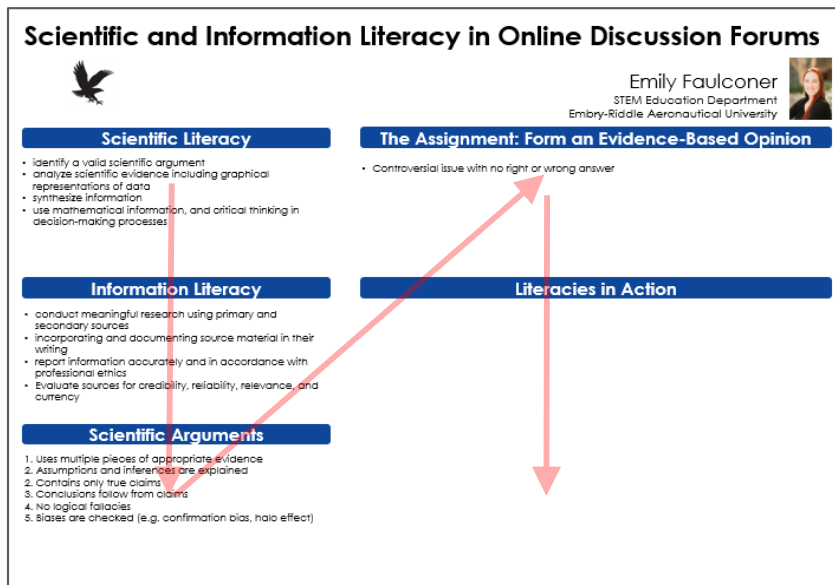
# Step 2: Set up your first draft.

## Presentation

- Assertion Evidence style

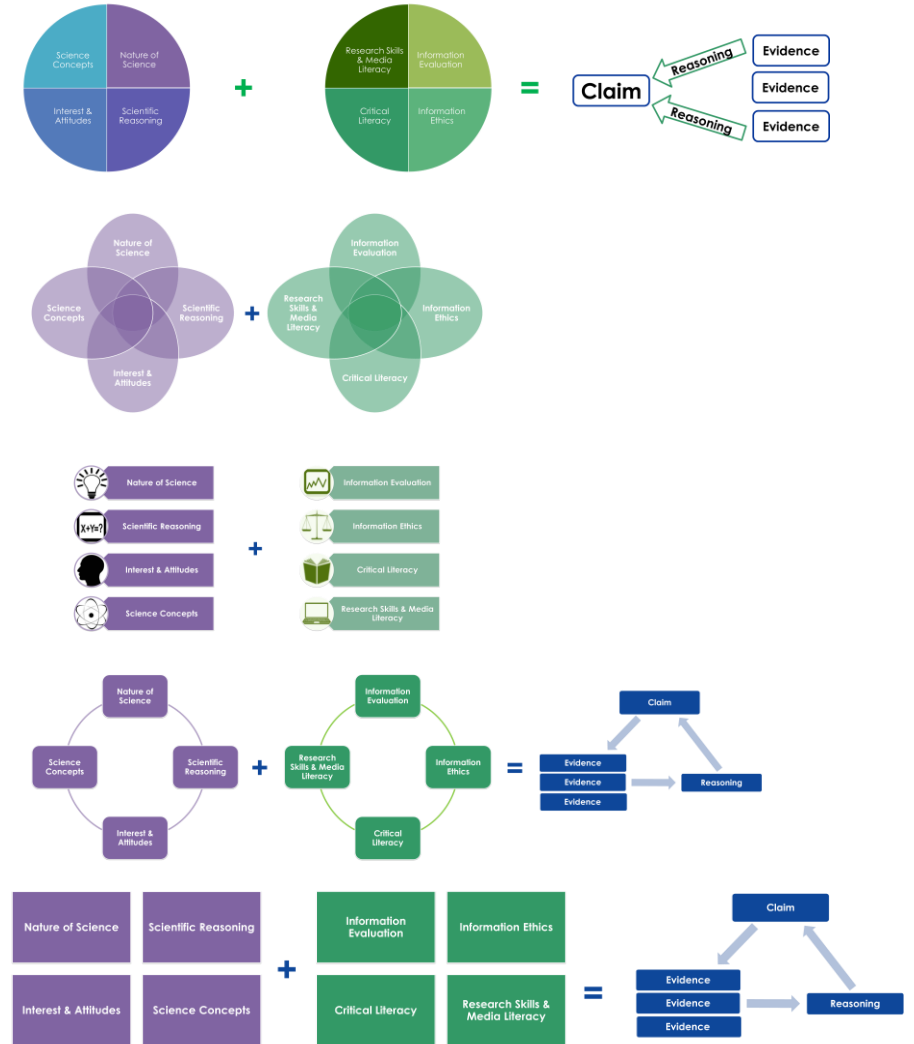
## Poster

- CoAS Templates
- Layout & Flow



# Step 3: Apply data visualization best practices.

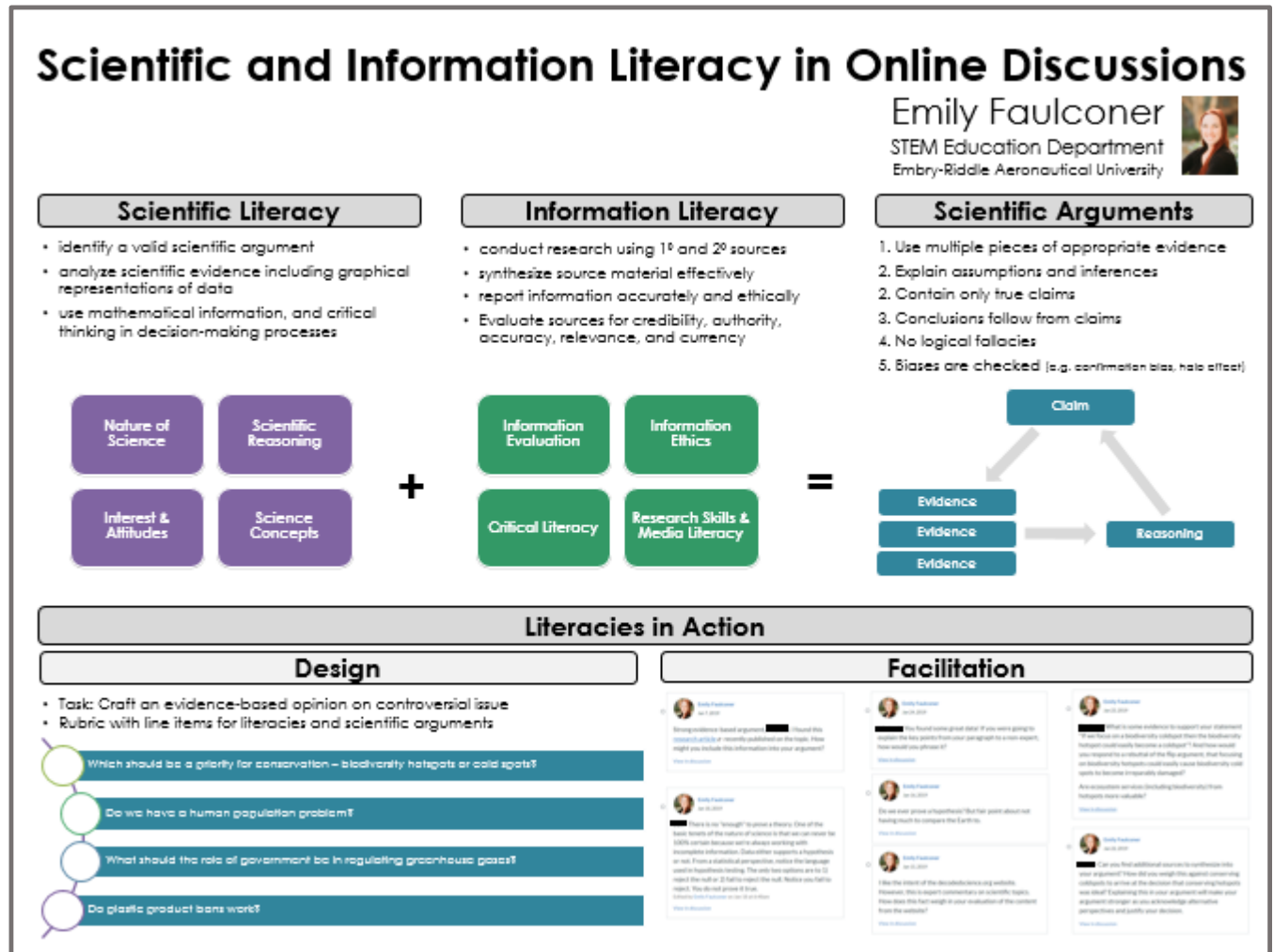
- ✓ Choose an effective visual.
- ✓ Use the right tool to generate that visual.
- ✓ Adjust image for the poster platform.
- ✓ Make your message clear.
- ✓ Do not settle for default settings.
- ✓ Ensure your figures are not misleading.
- ✓ Declutter and simplify.
- ✓ Tell a story with your images.





# Step 4: Focus your message.

- Engaging, short title
- Storytelling
- Visual hierarchy
  - ✓ Size and scale
  - ✓ Color
  - ✓ Contrast
  - ✓ Typographic Hierarchy
  - ✓ Spacing
  - ✓ Proximity
  - ✓ Negative space
  - ✓ Alignment
  - ✓ Rule of odds
  - ✓ Repetition





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- Engaging, short title
- Storytelling
- Visual hierarchy

- ## ✓ Size and scale

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✓ Proximity

✓ Negative space

## ✓ Alignment

✓ Rule of odds

## ✓ Repetition

## Scientific and Information Literacy in Online Discussions

Emily Faulconer

STEM Education Department  
Embry-Riddle Aeronautical University



## Scientific Literacy

- identify a valid scientific argument
- analyze scientific evidence including graphical representations of data
- use mathematical information, and critical thinking in decision-making processes

## Information Literacy

- conduct research using 1<sup>st</sup> and 2<sup>nd</sup> sources
- synthesize source material effectively
- report information accurately and ethically
- Evaluate sources for credibility, authority, accuracy, relevance, and currency

### Scientific Arguments

1. Use multiple pieces of appropriate evidence
2. Explain assumptions and inferences
2. Contain only true claims
3. Conclusions follow from claims
4. No logical fallacies
5. Biases are checked (e.g. confirmation bias, halo effect)



## Literacies in Action

## Design

- Task: Craft an evidence-based opinion on controversial issue
- Rubric with line items for literacies and scientific arguments

Which should be a priority for conservation – biodiversity hotspots or cold spots?

Do we have a human population problem?

What should the role of government be in regulating greenhouse gases?

## Do plastic product bans work?

## Facilitation

Strong evidence-based argument [redacted] I found this [research article](#) or recently published on the topic. How might you include this information into your argument?

There is no "enough" to prove a theory. One of the basic tenets of the nature of science is that we can never

used in hypothesis testing. The only two options are to 1) reject the null or 2) fail to reject the null. Notice you fail to reject. You do not prove it true.

**Emily Friedman**  
on Oct 2020

██████████ You found some great detail! If you were going to explain the key points from our paragraph to a non-expert, how would you phrase it?

[View all comments](#)

Do we ever prove a hypothesis? But fair point about not having much to compare the Earth to.

I like the intent of the [deconstruction.org](http://deconstruction.org) website. However, this is expert commentary on scientific topics.

 Emily Friedman  
Jan 13, 2019

What is some evidence to support your statement "If we focus on a biodiversity collapse then the biodiversity hotspot could easily become a coldspot"? And how would you respond to a rebuttal of the Rip argument, that focusing

Is this property shareable with others?

Can you find additional sources to synthesize into your argument? How did you weigh the against concerning college to arrive at the decision that concerning college was ideal? Explaining this in your argument will make your



# Role of Chemosensory Organs in Food Discrimination by *Manduca sexta*

Belinda N. Akpeng, Frank Hanson, Dept. of Biological Sciences, University of Maryland, Baltimore County, 1000 Hilltop Circle, Baltimore, MD 21250

**Abstract**

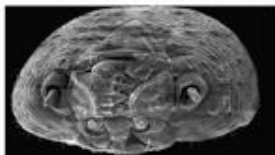
Recent work on the role of chemosensory organs in food discrimination in *Manduca sexta* has shown that the loss of these organs results in a significant decrease in the ability to discriminate between food sources. The present study was designed to determine the role of chemosensory organs in food discrimination in *Manduca sexta* by examining the effects of unilateral ablation of the maxillary taste receptors, the epipharynx, and the maxilla on food discrimination. The results show that the loss of these organs results in a significant decrease in the ability to discriminate between food sources.

**Introduction**

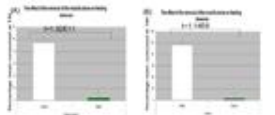
It has been shown by numerous studies that taste is an important sensory system in the feeding behavior of many animals. In *Manduca sexta*, taste is primarily mediated by the maxillary taste receptors, the epipharynx, and the maxilla. The loss of these organs results in a significant decrease in the ability to discriminate between food sources.

**Materials and Methods**

On 100 larvae of *M. sexta* were collected from the University of Maryland. The larvae were reared on a diet of alfalfa leaves. The larvae were divided into four groups: control, unilateral maxillary ablation, unilateral epipharynx ablation, and unilateral maxilla ablation. The larvae were then tested for their ability to discriminate between food sources.



Question 1. In the absence of the maxillary taste receptors, would discrimination be reduced?



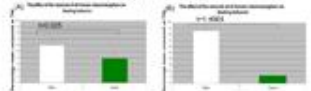
Question 2. If both epipharynx and maxilla are missing, would discrimination decrease?



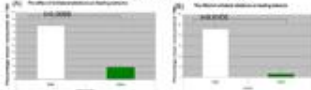
## Acknowledgements

This work was funded, in part, by the Biology Department Designated Research Fund.  
I would like to thank Dr. Frank Hanson for his guidance and supervision on this project.  
I would also like to acknowledge Dr. Jeremy Davis for his advice and contributions.

Question 3. Would the removal of all three chemoreceptors reduce discrimination?



Question 4. Since all known chemoreceptors come in pairs, would unilateral ablations decrease or increase discrimination?



## Conclusion

Results of all known chemoreceptors resulted in loss of discrimination. Chemosensory organs play an important role in the food selection process of *M. sexta*. Both gustatory and olfactory organs play significant roles in the food selection process of the tobacco hornworm.

## Applications

The feeding preferences of both control and normal larvae are very similar. Basic knowledge of chemosensory and olfactory compounds could be useful in designing methods of pest control.

## Future Directions

Further study of the role of all known chemosensory organs in the discrimination among food and non-food items is needed.

## References

De Groot, J. and P. H. Hanson. 1987. Differentiation of taste of chemosensory organs in food discrimination among food and non-food items by larvae of the tobacco hornworm, *Manduca sexta*. *Physiology* 10: 1010-1016.  
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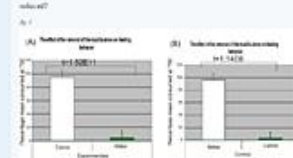
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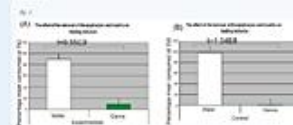
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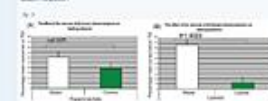
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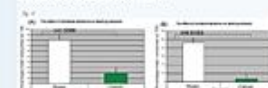
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  - ✓ **Typographic Hierarchy**
  - ✓ Spacing
  - ✓ Proximity
  - ✓ Negative space
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  - ✓ Rule of odds
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## Scientific and Information Literacy in Online Discussions

Emily Faulconer  
STEM Education Department  
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**Scientific Literacy**

- identify a valid scientific argument
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Nature of Science

Scientific Reasoning

Interest & Attitudes

Science Concepts

**Information Literacy**

- conduct research using 1<sup>st</sup> and 2<sup>nd</sup> sources
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Information Evaluation

Information Ethics

Critical Literacy

Research Skills & Media Literacy

**Scientific Arguments**

1. Use multiple pieces of appropriate evidence
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Claim

Evidence

Evidence

Evidence

Reasoning

**Literacies in Action**

**Design**

- Task: Craft an evidence-based opinion on controversial issue
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Which should be a priority for conservation – biodiversity hotspots or cold spots?

Do we have a human population problem?

What should the role of government be in regulating greenhouse gases?

Do plastic product bans work?

**Facilitation**

Being evidence based argues that... found this research article on... recently published in... magazine. How might you include this information into your argument?

View Discussion

There is no "strong" to prove a theory. One of the basic tenets of the nature of science is that we can never be 100% certain because we're always working with incomplete information. (Data either supports a hypothesis or not. There is a probability of error; neither the language used in hypothesis testing. The only two options are to reject the null or to fail to reject the null. Notice you didn't reject. You did not prove it true.

View Discussion

What is some good data? If you were going to research the loss of biodiversity, what would you focus on? How would you phrase it?

View Discussion

Do we ever prove a hypothesis? (that has been about not having much to compare the Earth's).

View Discussion

How the intent of the decision-making activity. Response, then support connections to scientific topics. How does this then weigh in your evaluation of the content from the website?

View Discussion

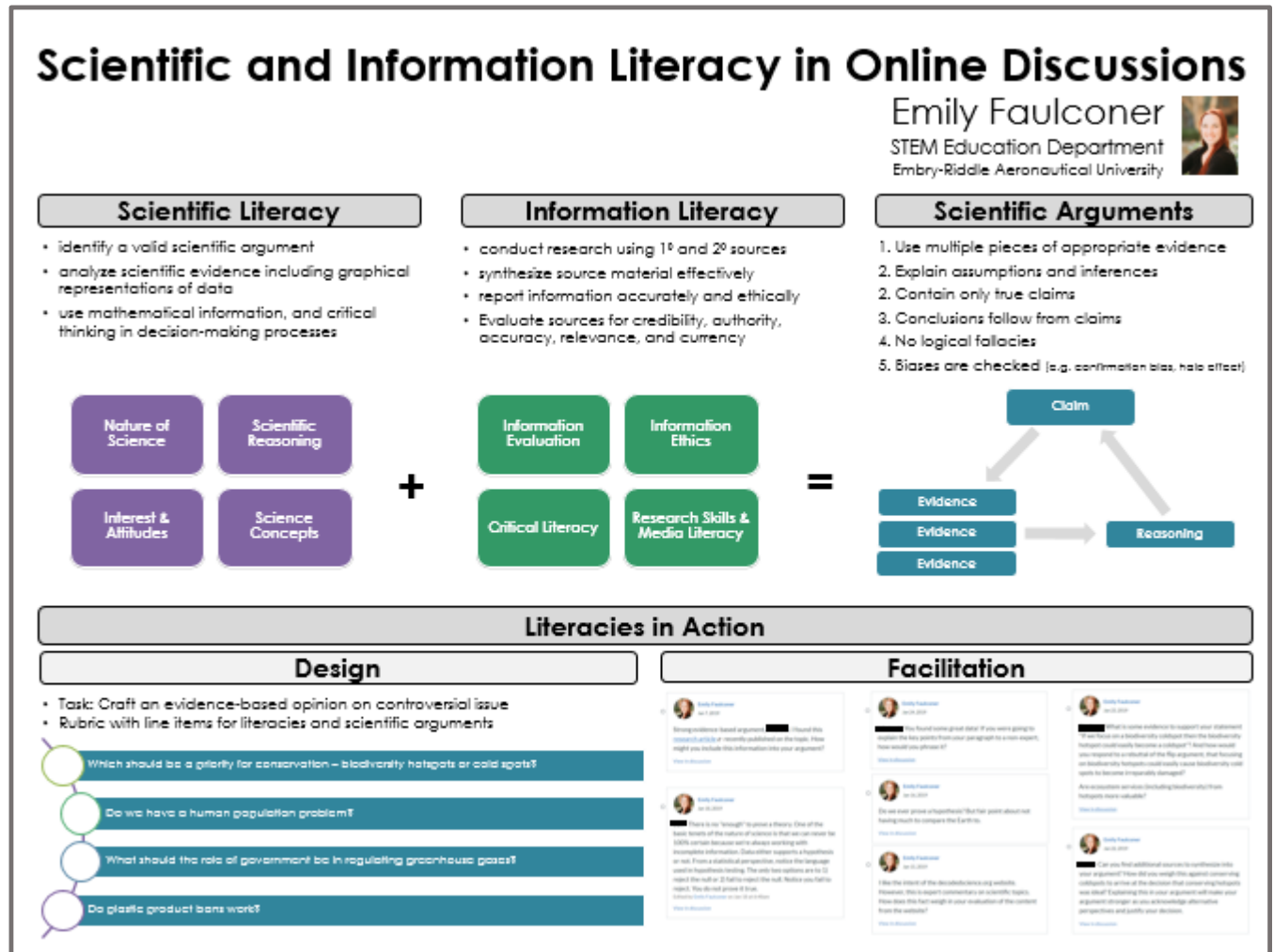
Can you find additional sources to synthesize into your argument? How did you weigh this against competing evidence to arrive at the decision that conservation hotspots were best? Explaining this in your argument will make your argument stronger as you acknowledge alternative perspectives and justify your decision.

View Discussion



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```
graph TD
    subgraph SL [Scientific Literacy]
        NS[Nature of Science]
        SR[Scientific Reasoning]
        IA[Interest & Attitudes]
        SC[Science Concepts]
    end
    subgraph IL [Information Literacy]
        IE[Information Evaluation]
        IET[Information Ethics]
        CL[Critical Literacy]
        RSM[Research Skills & Media Literacy]
    end
    SL + IL = SA[Scientific Arguments]
    subgraph SA [Scientific Arguments]
        E[Evidence] --> R[Reasoning]
        R --> C[Claim]
    end
```

### Literacies in Action


#### Design

- Task: Craft an evidence-based opinion on controversial issue
- Rubric with line items for literacies and scientific arguments



```
graph TD
    T[Task: Craft an evidence-based opinion on controversial issue] --> Q1[Which should be a priority for conservation - biodiversity hotspots or cold spots?]
    Q1 --> Q2[Do we have a human population problem?]
    Q2 --> Q3[What should the role of government be in regulating greenhouse gases?]
    Q3 --> Q4[Do plastic product bans work?]
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#### Facilitation



# Step 5: Keep it simple.

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Science Concepts

+

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Evidence

Evidence

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**Literacies in Action**

**Design**

- Task: Craft an evidence-based opinion on controversial issue
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Which should be a priority for conservation – biodiversity, habitats or cold spots?




Do we have a human population problem?




What should the role of government be in regulating greenhouse gases?

Do plastic product bans work?

**Facilitation**








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What should the role of government be in regulating greenhouse gases?

Do plastic product bans work?

**Facilitation**









# Step 6: Get creative with it.

## Posters

- Multimedia
- Hidden panels
- Doodle space (transparency film)

## Presentations

- Active learning strategies
- Interactive components
- Open strong. Close strong

*What are some ideas you've seen?*



# Step 7: Prepare to present.

- ✓ Practice. Practice. Practice. Repeat.
- ✓ Brainstorm questions
- ✓ Print your poster
- ✓ Prepare your supplemental materials
  - ✓ handouts
  - ✓ business cards
  - ✓ push pins and tape
  - ✓ white out and pen to correct typos



# In Review

- **Networking and name-recognition** occur through posters and presentations.
- **Focus your message** using data visualization and graphic design best practices.
- **Keep it simple.**

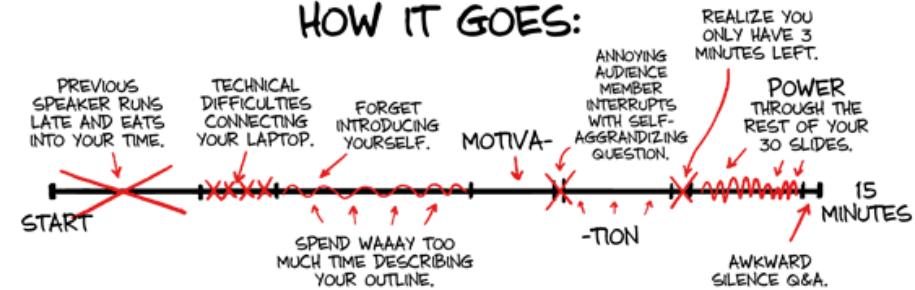



# YOUR CONFERENCE PRESENTATION

## HOW YOU PLANNED IT:



## HOW IT GOES:





Thank You  
*Any Questions?*

<https://www.surveymonkey.com/r/PostersPresentations>